

# (12) UK Patent Application (19) GB (11) 2 271 753 (13) A

(43) Date of A Publication 27.04.1994

(21) Application No 9321672.9

(22) Date of Filing 20.10.1993

(30) Priority Data

(31) 9222107 (32) 21.10.1992 (33) GB

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(51) INT CL<sup>5</sup>

B65B 51/26, B65D 75/44

(52) UK CL (Edition M)

B8C CWSZ CW16 C405

B5K K3A3 K3C

U1S S1075 S1077 S1094 S1813

(56) Documents Cited

GB 1303669 A EP 0130148 A2 US 3925959 A

(58) Field of Search

UK CL (Edition L) B8C CU32 CWSZ CW16 CW17

INT CL<sup>5</sup> B65B 9/10 9/12 51/26 51/30, B65D 75/40

75/44 75/46 75/48 75/50

ONLINE DATABASES : WPI

## (54) Form, fill and seal packaging with inclined transverse seals

(57) A method of making form, fill and seal packages (32) comprises supplying packaging film in the form of a web (20), converting the web into a continuous hollow tube (21), feeding a product (28) into the tube, pressure and heat sealing the filled tube at intervals, and cutting within the sealed areas (33, 35), characterised in that at least every other sealed area (33) makes an angle with the axis of the tube other than 90°.

Selection of the angle is made possible by rotary mounting (about axis 37) of assemblies comprising reciprocating sealing jaws (26 A/B) and cutters (27). Alternate sealed areas may make equal and opposite angles to the tube axis and either meet so that the packages are of isosceles or equilateral triangular shape or be spaced so that the packages have a trapeziform. Alternatively, the packages may be of diamond or rhombic shape, or of the shapes such as a chevron.

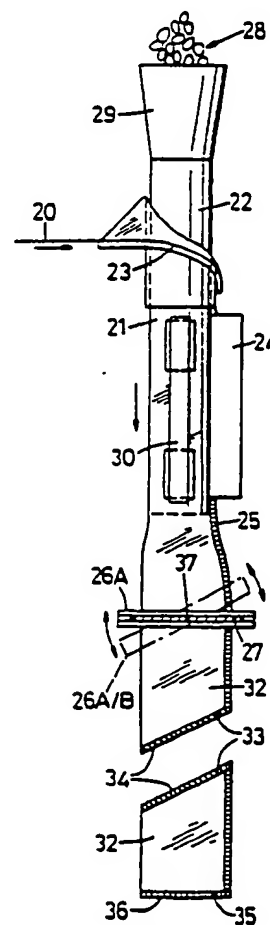


Fig. 2

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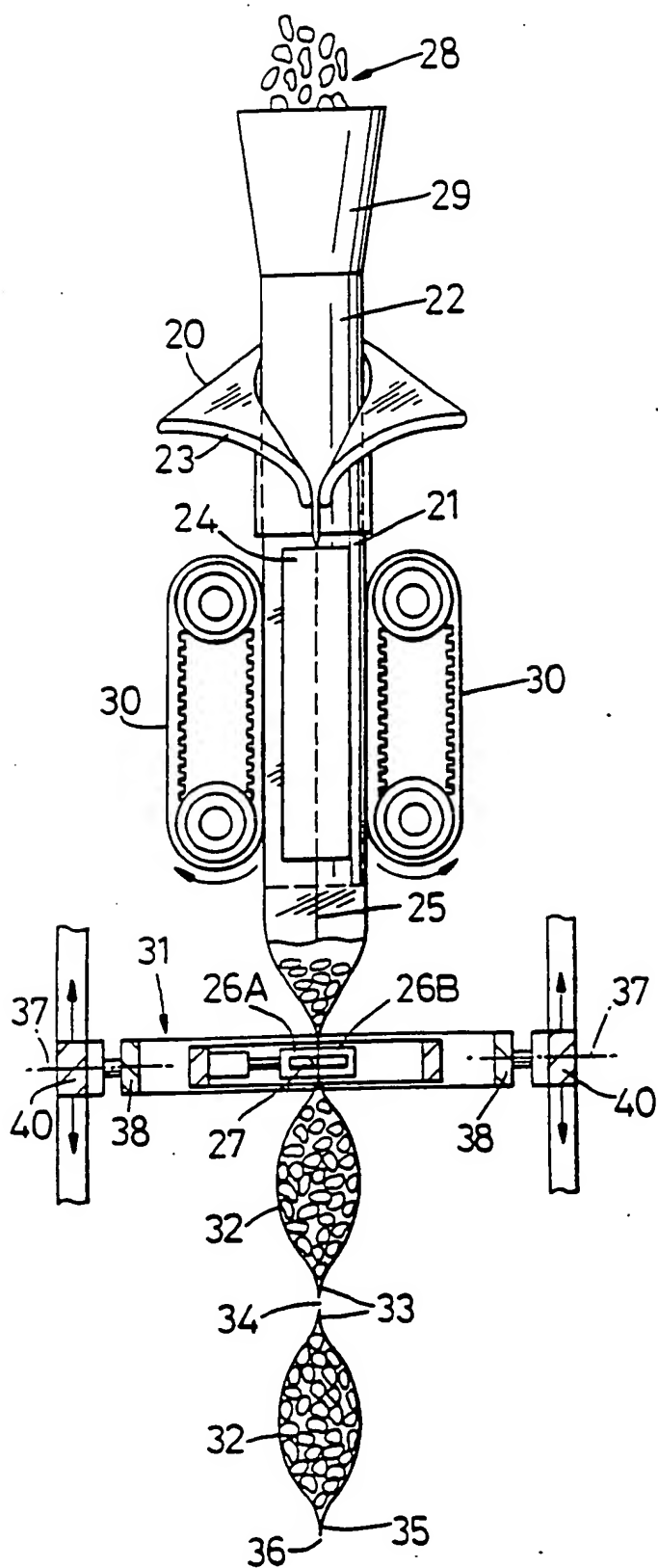


Fig. 1

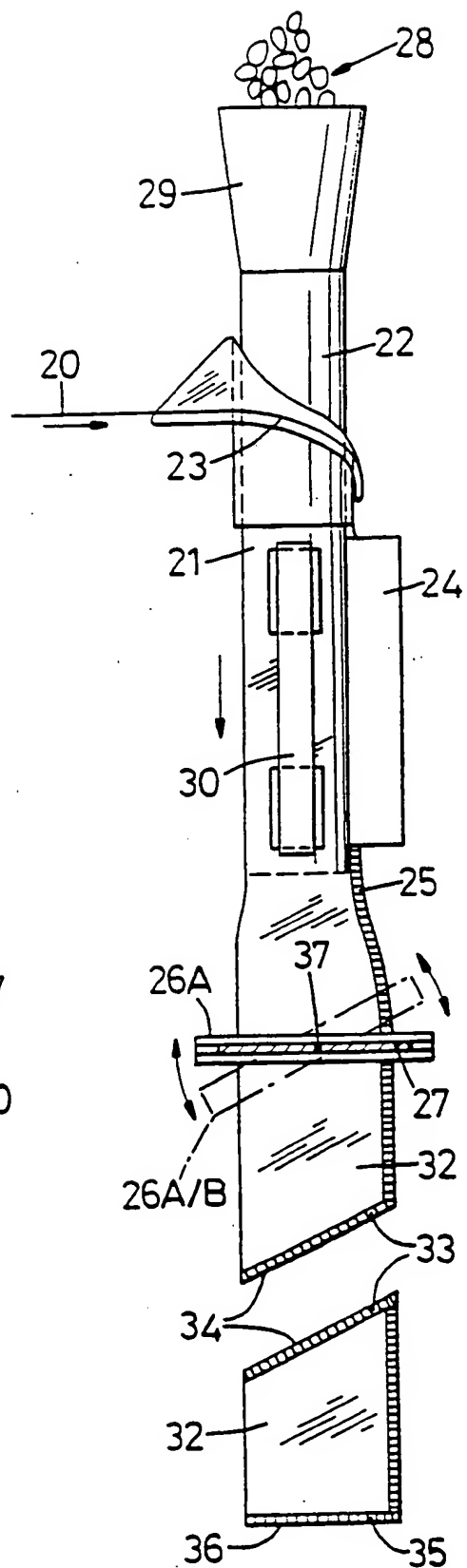


Fig. 2

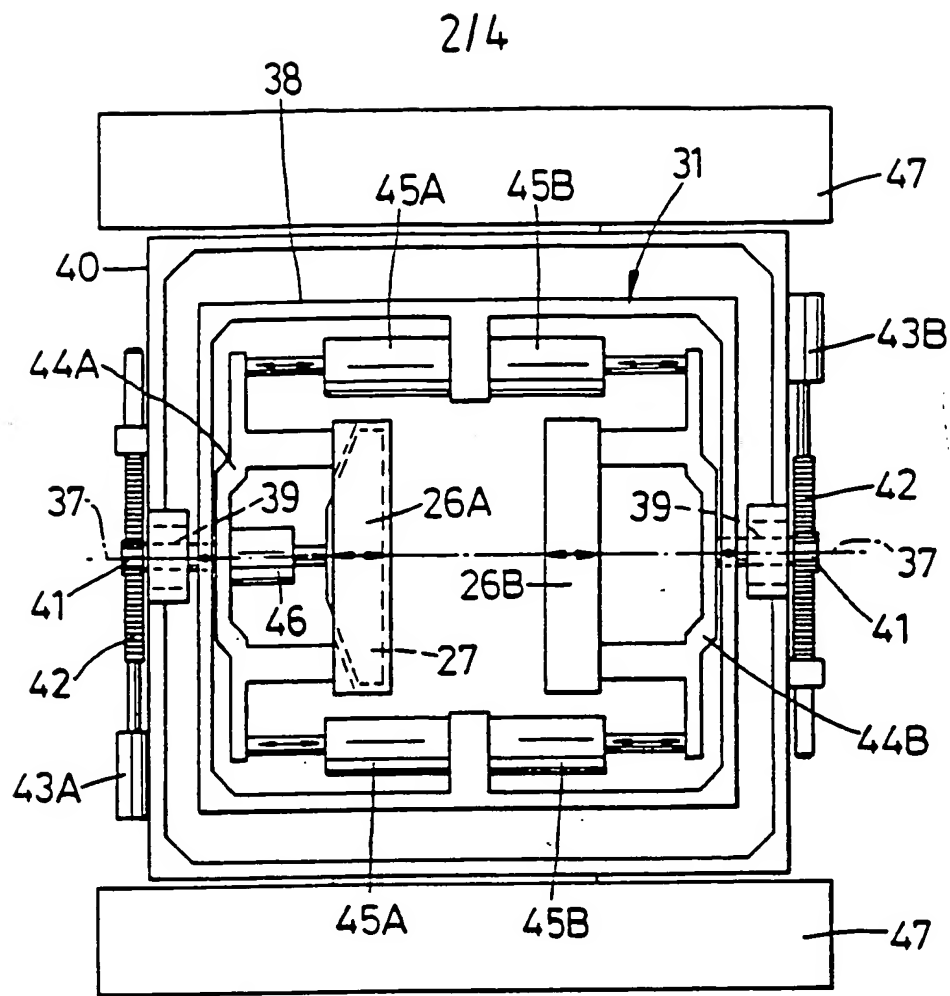


Fig. 3

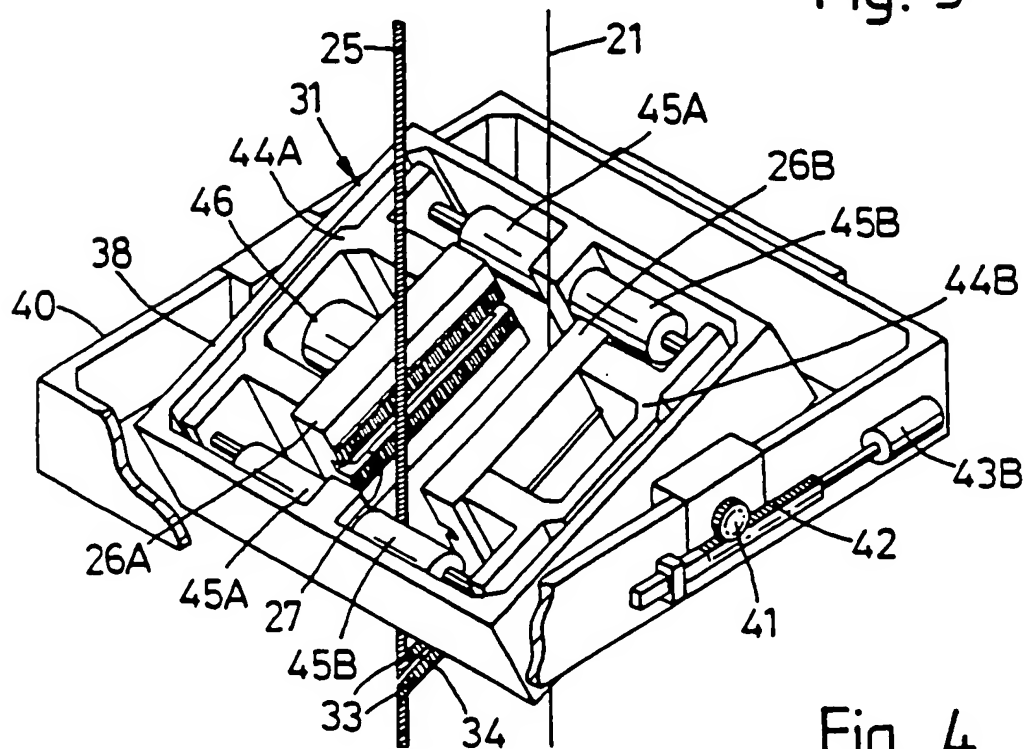


Fig. 4

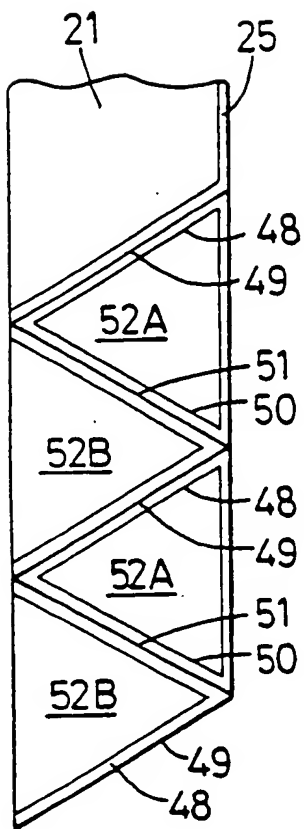


Fig. 5

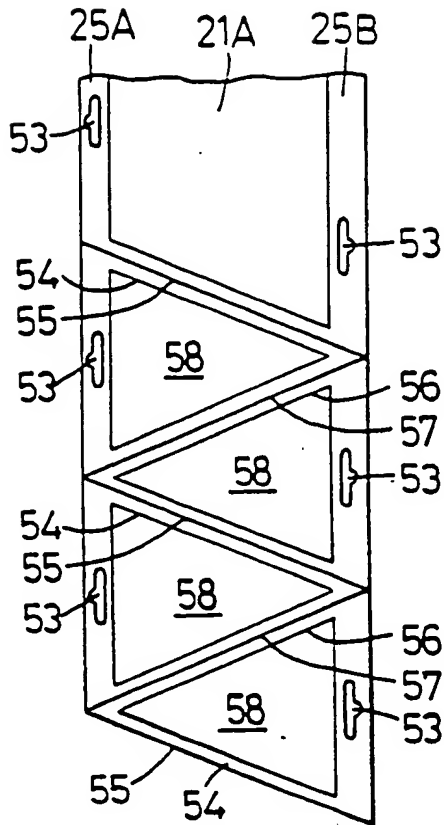


Fig. 8

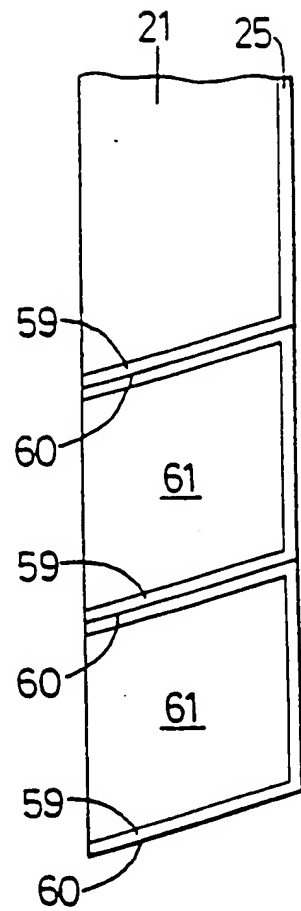


Fig. 10



Fig. 6

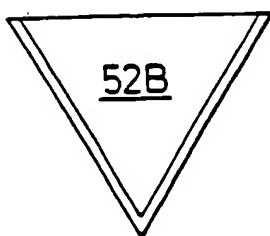


Fig. 7

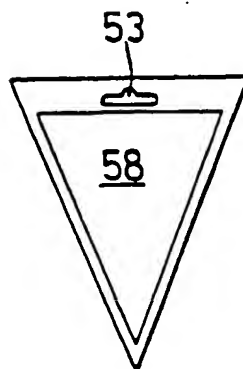


Fig. 9

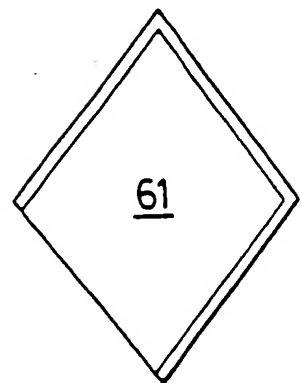


Fig. 11

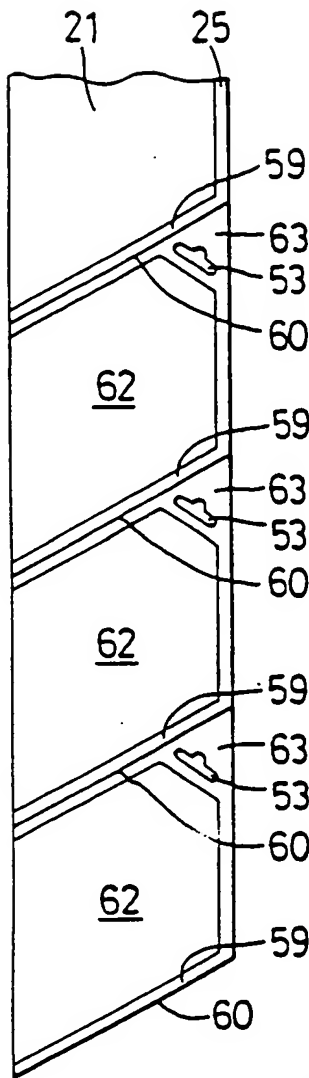


Fig. 12

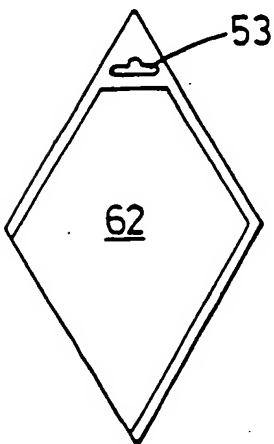


Fig. 13

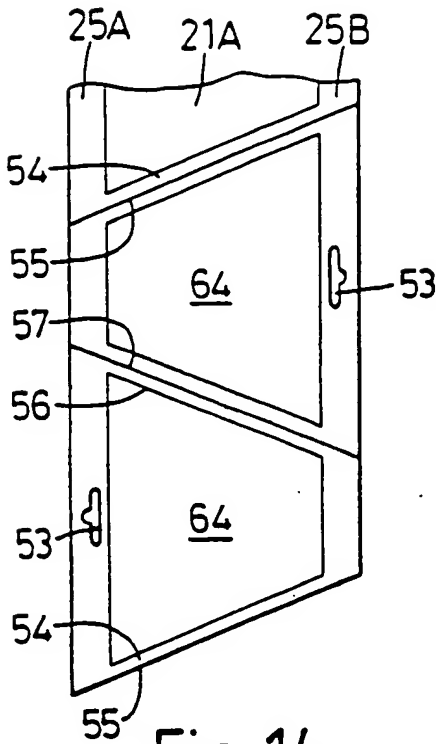


Fig. 14

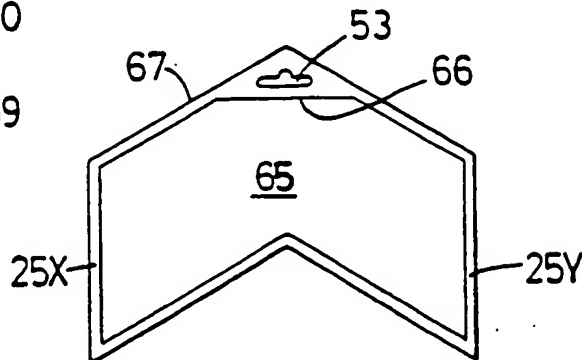


Fig. 17

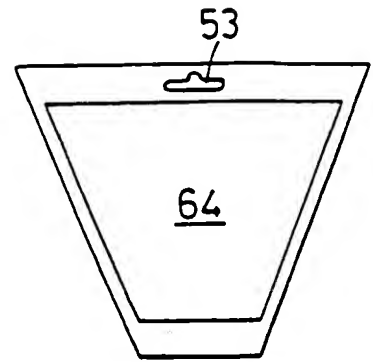


Fig. 15

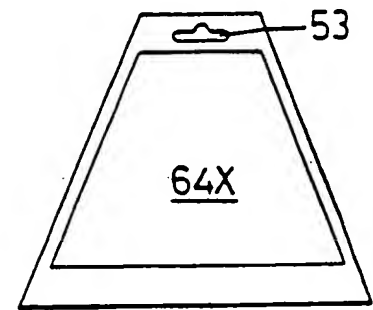


Fig. 16

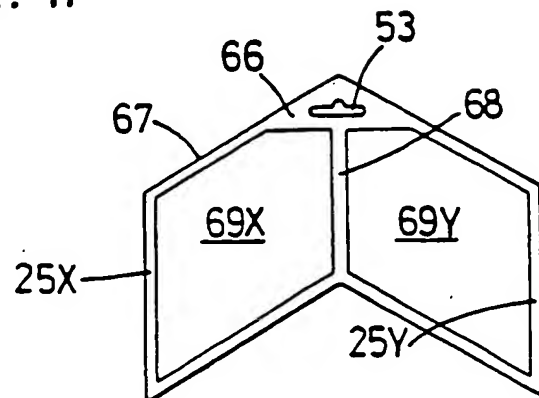


Fig. 18

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## FORM, FILL AND SEAL PACKAGING

This invention relates to form, fill and seal packaging in which packaging film is supplied in the form of a web, the web is converted into a continuous hollow tube, a product is fed into the tube, the filled tube is pressure and heat sealed at intervals, and then cut within the sealed areas to create a consecutive series of filled packages, sometimes referred to as pillow-shaped bags.

Conversion of the web into a continuous hollow tube is usually effected over a hollow cylindrical mandrel or nozzle through which the product is fed, and reciprocating jaws effect the sealing and cutting. The jaws are frequently mounted on a carriage that is driven for movement in the direction of the bag forming. Stripper plates may be mounted below the sealing jaws, which stripper plates are brought by partial closing of the jaws into engagement with the tube to flatten it and strip any product from the zone to be subsequently sealed and cut upon completion of closing of the jaws.

The jaws are usually aligned perpendicular to the axis of the tube, but two such pairs of jaws spaced in the direction of the bag forming may be driven for movement in directions mutually perpendicular to each other to create tetrahedral shaped packages.

According to one aspect of the present invention, a method of making form, fill and seal packages comprises supplying packaging film in the form of a web, converting the web into a continuous hollow tube, feeding a product into the

to the axis of the tube. Thus, alternate sealed areas may meet at opposite angles so that the packages have an isosceles or equilateral triangular shape; alternatively alternate sealed areas making opposite angles may be spaced in the direction of the bag forming so that the packages have a trapeziform. Again, alternate sealed areas may be spaced in the direction of the bag forming and make the same angle to the axis of the tube so that the packages have a diamond or rhombic shape.

Self adhesive labels, especially of a shape corresponding to that of the packages, may be readily applied thereto.

The product may be liquid, or solid, frozen foods, or loose products, such as snack foods.

According to a further aspect of the present invention, a form, fill and seal packaging machine comprises a carriage or frame upon which an assembly of reciprocating sealing and cutting jaws is mounted for rotation about an axis parallel to the direction of closing of the jaws and perpendicular to the direction of the bag forming, and means is provided for moving the assembly to bring the jaws to any angle within a range of angles to the direction of the bag forming.

With the assembly able to pass through a position in which the sealing and cutting jaws are perpendicular to the direction of bag forming (as the assembly moves the jaws between opposite angles), the machine can also be used, if desired, for forming rectangular (or square) bags.

accordance with the invention;

Figures 6 and 7 show individual packages formed by the method illustrated by Figure 5;

5 Figure 8 corresponds to Figure 5 but illustrates a modified method in which each package is provided with a so-called euro-slot;

Figure 9 shows an individual package formed by the method of Figure 8 in the attitude in which it would hang by its euro-slot;

10 Figure 10 corresponds to Figure 5 or Figure 8 but illustrates another method of forming packages in accordance with the invention;

Figure 11 shows an individual package formed by the method of Figure 10;

15 Figure 12 corresponds to Figure 10 but illustrates a modified method in which each package is provided with a euro-slot;

Figure 13 shows an individual package formed by the method of Figure 12 in the attitude in which it would hang by its euro-slot;

20 Figure 14 corresponds to Figure 8 but illustrates a modification of the method;

Figure 15 shows an individual package formed by the method of Figure 14 in the attitude in which it would hang by its euro-slot;

25 Figure 16 corresponds to Figure 15 but shows an alternative position for the euro-slot;

Figure 17 shows yet another form of package in



assembly 31 about an axis 37 by means shown, by way of example only, in Figures 3 and 4 in which the jaw assembly has an inner frame 38 with stub shafts 39 journaled in an outer frame or carriage 40, and pinions 41 secured to the stub shafts mesh with racks 42 reciprocated by pneumatic cylinders 43A, 43B one for rotation in one direction and the other for rotation in the opposite direction, under the control of means not shown. The jaws 26A, 26B are carried by sub-frames 44A, 44B reciprocated by pairs of pneumatic cylinders 45A, 45B, and the cutter 27 is reciprocated by a pneumatic cylinder 46, all likewise under the control of means not shown. The outer frame or carriage 40 is mounted in conventional manner between vertical guide members 47, which are not shown in Figure 4.

In Figure 5 alternate sealed areas 48, 50 (with corresponding cuts 49, 51) meet and make equal but opposite angles to the axis of the tube 21 so as to form packages 52A, 52B of equilateral triangular shape, as also shown in Figures 6 and 7.

In Figure 8 the tube 21A is formed from two films with seams 25A, 25B in which are punched euro-slots 53 in alternation prior to forming sealed areas 54, 56 (with corresponding cuts 55, 57) meeting and making equal but opposite angles to the axis of the tube 21A so as to form packages 58 of isosceles triangular shape, one also being shown in Figure 9 in the attitude in which it would hang by its euro-slot 53.

In Figure 10 the tube 21 is provided with sealed areas 59 (with cuts 60) spaced in the direction of the bag forming

tube.

Likewise, a permanently set jaw assembly could have two-part jaws (not shown) and two-part cutter having the two-parts of each jaw (and cutter) making equal and opposite angles to the axis of the tube to form chevron shaped packages such as of the type 65 shown in Figure 17 with a euro-slot 53 in an additional triangular sealed area 66 below the upper cut 67. Figure 17 also shows two longitudinal seam portions 25X, 25Y, while in Figure 18 a similar formation also has a sealed area 68 down the middle to define two package compartments 69X, 69Y.

web of packaging film converted into a continuous hollow tube and sealed transversely at intervals are characterised in that at least every other sealed area makes an angle with the axis of the tube other than  $90^{\circ}$ .

5           9. Packages as in Claim 8, wherein alternate sealed areas make equal angles to the axis of the tube.

10           10. Packages as in Claim 9, wherein alternate sealed areas meet at opposite angles so that the packages have an isosceles or equilateral triangular shape.

11. Packages as in Claim 9, wherein alternate sealed areas making opposite angles are spaced in the direction of the bag forming so that the packages have a trapeziform.

15           12. Packages as in Claim 8, wherein alternate sealed areas are spaced in the direction of the bag forming so that the packages have a diamond or rhombic shape.

13. Packages as in any one of Claims 8 to 12, wherein a sealed area of each package contains a euro-slot.

20           14. Packages as in any one of Claims 8 to 13, with self-adhesive labels of a shape corresponding to that of the packages are applied thereto.

25           15. A form, fill and seal packaging machine comprising a carriage or frame upon which an assembly of reciprocating sealing and cutting jaws is mounted for rotation about an axis parallel to the direction of closing of the jaws and perpendicular to the direction of the bag forming, and means for moving the assembly to bring the jaws to any angle within a range of angles to the direction of the bag forming.

16. A machine as in Claim 15, wherein the means for

Relevant Technical Fields

(i) UK Cl (Ed.L) B8C (CU32, CWS2, CW16, CW17)

(ii) Int Cl (Ed.5) B65B 9/10, 9/12, 51/26, 51/30; B65D 75/40,  
75/44, 75/46, 75/48, 75/50

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE DATABASES : WPI

Search Examiner  
S R SMITH

Date of completion of Search  
17 NOVEMBER 1993

Documents considered relevant  
following a search in respect of  
Claims :-  
1 TO 21

Categories of documents

- X: Document indicating lack of novelty or of inventive step. P: Document published on or after the declared priority date but before the filing date of the present application.
- Y: Document indicating lack of inventive step if combined with one or more other documents of the same category. E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.
- A: Document indicating technological background and/or state of the art. &: Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages	Relevant to claim(s)
X	GB 1303669 (REUTTER) - whole document, especially lines 64 to 83 of page 2	1, 4, 8, 9, 12, 15
X	EP 0130148 A2 (SIG) - see Figures 1 and 3 to 6	1, 4, 5, 6, 8, 9, 11, 12
X	US 3925959 (DYKES) - see lines 49 to 61 of column 2 and Figures 21 and 22	1, 8, 9

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